



*The leader in acoustics and vibration...*

**INVESTIGATIVE SCIENCE AND ENGINEERING, INC.**

*Scientific, Environmental, and Forensic Consultants*

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September 6, 2005

Mr. Michael J. Toby  
3087 Honey Hill Ranch Road  
Alpine, CA 91901

**RE: ACOUSTICAL SITE ASSESSMENT  
HONEY HILL RANCH ROAD TM5437 (ER 05-14-025) – SAN DIEGO, CA  
ISE REPORT #05-014**

Dear Mr. Toby:

At your request, Investigative Science and Engineering (ISE) have performed an acoustical site assessment of the proposed Honey Hill Ranch Road residential subdivision (TM5437, APN 404-032-73) located in San Diego, California. The results of that survey, as well as predicted future noise levels at the project site, are presented in this letter report.



**INTRODUCTION AND DEFINITIONS**

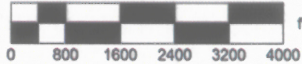
**Existing Site Characterization**

The project site consists of approximately 4.2 acres located in the unincorporated area of Alpine within the County of San Diego. The project site is located south of Interstate 8 (I-8) and Alpine Boulevard between Victoria Drive and Willows Road. I-8 provides regional access to the project area (refer to Figure 1 on the following page).

The proposed development area currently resides with existing residential structures. Elevations across the site range from approximately 2,055 to 2,115 feet above mean sea level (MSL). A satellite of the project community setting can be seen in Figure 2 on Page 3 of this report.

**SDC DPLU RCVD 5-25-06  
TM5437**





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**FIGURE 2: Project Site Satellite Aerial Photograph (CNES 2004)**



### Project Description

The existing project zoning is designated as residential (RR2) and is consistent with the proposed development. The development plan calls for the construction of six new single-family lots with a minimum lot size of 0.5-acres in addition to the existing residence to remain (refer to Figure 3 below). Each parcel will have a small amount of grading and the entire project would consist of a balance cut/fill operation moving only approximately 8,250 cubic yards. The project is also proposing a five-foot-high berm along the northern portion of Lots 1 through -3 as a mitigation measure for noise.

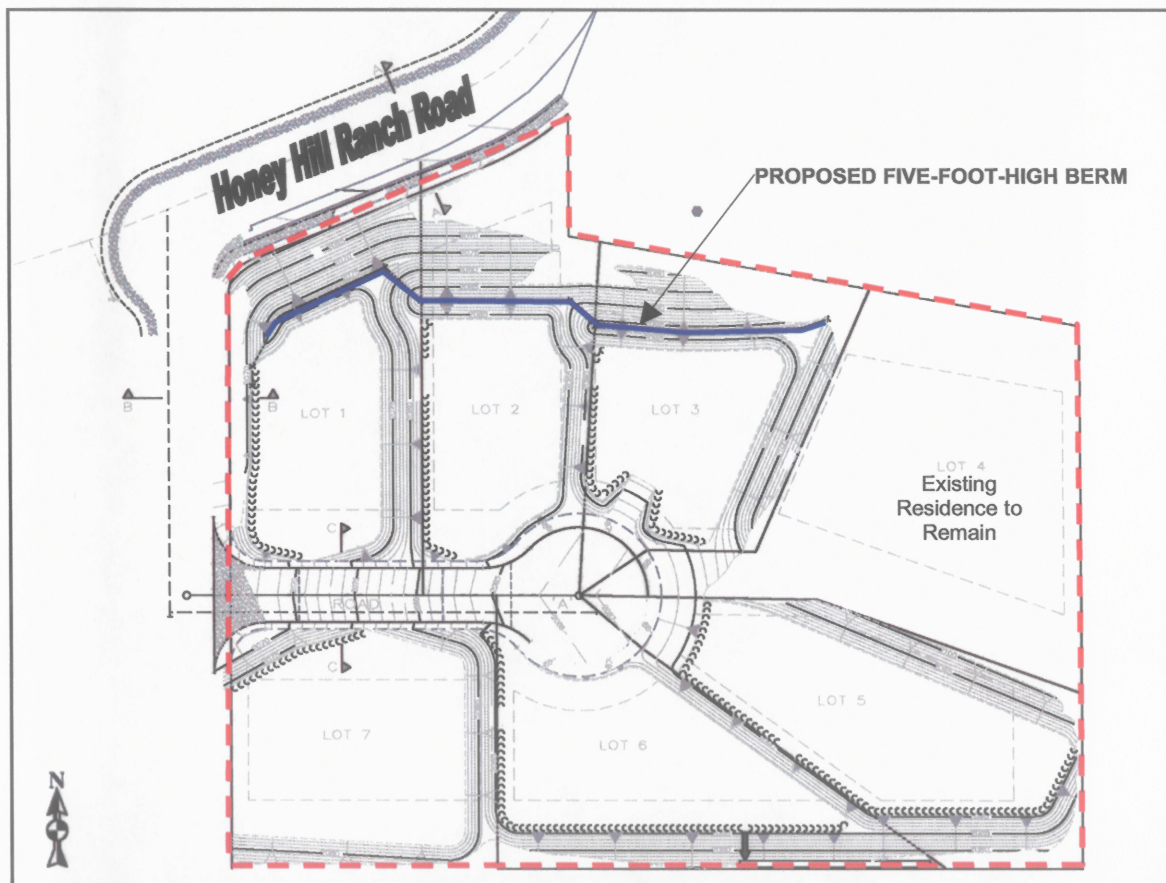


FIGURE 3: Proposed Honey Hill Ranch Road Site Plan (Snipes-Dye Associates, 8/05)

### Acoustical Definitions

Sound waves are linear mechanical waves. They can be propagated in solids, liquids, and gases. The material transmitting such a wave oscillates in the direction of propagation of the wave itself. Sound waves originate from some sort of vibrating surface. Whether this surface is the vibrating string of a violin or a person's vocal cords,



a vibrating column of air from an organ or clarinet, or a vibrating panel from a loudspeaker, drum, or aircraft, the sound waves generated are all similar. All of these vibrating elements alternately compress the surrounding air during forward motion and expand it on the backward movement.

There is a large range of frequencies within which linear waves can be generated, sound waves being confined to the frequency range that can stimulate the auditory organs to the sensation of hearing. For humans this range is from about 20 Hertz (Hz or cycles per second) to about 20,000 Hz. The air transmits these frequency disturbances outward from the source of the wave. Sound waves, if unimpeded, will spread out in all directions from a source. Upon entering the auditory organs, these waves produce the sensation of sound. Waveforms that are approximately periodic or consist of a small number of periodic components can give rise to a pleasant sensation (assuming the intensity is not too high), for example, as in a musical composition. Noise, on the other hand, can be represented as a superposition of periodic waves with a large number of components.

Noise is generally defined as unwanted or annoying sound that is typically associated with human activity and which interferes with or disrupts normal activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day, and the sensitivity of the individual hearing the sound.

Airborne sound is a rapid fluctuation of air pressure above and below atmospheric levels. The loudest sounds that the human ear can hear comfortably are approximately one trillion (or  $1 \times 10^{12}$ ) times the acoustic energy that the ear can barely detect. Because of this vast range, any attempt to represent the acoustic intensity of a particular sound on a linear scale becomes unwieldy. As a result, a logarithmic ratio originally conceived for radio work known as the decibel (dB) is commonly employed.

A sound level of zero "0" dB is scaled such that it is defined as the threshold of human hearing and would be barely audible to a human of normal hearing under extremely quiet listening conditions. Such conditions can only be generated in anechoic or "dead rooms". Typically, the quietest environmental conditions (extreme rural areas with extensive shielding) yield sound levels of approximately 20 dB. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB roughly correspond to the threshold of pain and would be associated with sources such as jet engine noise or pneumatic equipment.

The minimum change in sound level that the human ear can detect is approximately 3 dB. A change in sound level of 10 dB is usually perceived by the average person as a doubling (or halving) of the sounds loudness. A change in sound level of 10 dB actually represents an approximate 90 percent change in the sound



intensity, but only about a 50 percent change in the perceived loudness. This is due to the nonlinear response of the human ear to sound.

As mentioned above, most of the sounds we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies differing in sound level. The intensities of each frequency add to generate the sound we hear. The method commonly used to quantify environmental sounds consists of determining all of the frequencies of a sound according to a weighting system that reflects the nonlinear response characteristics of the human ear. This is called "A" weighting, and the decibel level measured is called the A-weighted sound level (or dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of sounds from distant sources that create a relatively steady background noise in which no particular source is identifiable. For this type of noise, a single descriptor called the Leq (or equivalent sound level) is used. Leq is the energy-mean A-weighted sound level during a measured time interval. It is the 'equivalent' constant sound level that would have to be produced by a given source to equal the average of the fluctuating level measured. For most acoustical studies, the study interval is generally taken as one-hour and is abbreviated *Leq-h*; however, other time intervals are utilized depending on the jurisdictional preference.

To describe the time-varying character of environmental noise, the statistical noise descriptors L10, L50, and L90 are commonly used. They are the noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of a stated time. Sound levels associated with the L10 typically describe transient or short-term events, while levels associated with the L90 describe the steady state (or most prevalent) noise conditions. In addition, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the maximum and minimum measured sound level (Lmax and Lmin) indicators. The Lmin value obtained for a particular monitoring location is often called the *acoustic floor* for that location.

Another sound measure employed by the State of California and the County of San Diego is known as the Community Noise Equivalence Level (CNEL) is defined as the "A" weighted average sound level for a 24-hour day. It is calculated by adding a 5-decibel penalty to sound levels in the evening (7:00 p.m. to 10:00 p.m.), and a 10-decibel penalty to sound levels in the night (10:00 p.m. to 7:00 a.m.) to compensate for the increased sensitivity to noise during the quieter evening and nighttime hours.





## **APPLICABLE SIGNIFICANCE CRITERIA**

### **County of San Diego Noise Regulations**

Transportation noise levels in the County of San Diego are governed under the Noise Element of the County's General Plan. The relevant sections of the Noise Element are cited below. Exterior noise standards are typically applied to areas within a proposed development that would be classified as "usable exterior space", such as rear and some side yards.

1. Whenever possible, development in San Diego County should be planned and constructed so that noise sensitive areas are not subject to noise levels in excess of 55 dBA CNEL.
2. Whenever it appears that new development will result in any (existing or future) noise sensitive areas being subjected to noise levels in excess of 60 dBA CNEL or greater, an acoustical study should be required.
3. If the acoustical study shows that noise levels at any noise sensitive areas will exceed 60 dBA CNEL, the development should not be approved unless the following findings are made:
  - a) Modifications to the development have been or will be made which reduce the exterior noise level below 60 dBA CNEL; or,
  - b) If, with the current noise abatement technology, it is infeasible to reduce the exterior CNEL to 60 dBA, then modifications to the development will be made which reduce interior noise below a CNEL equal to 45 dBA. Particular attention shall be given to noise sensitive interior spaces such as bedrooms; and,
  - c) If finding 'b' above is made, a further finding will be made that there are specifically identified overriding social or economic considerations which warrant approval of the development without modifications as described in 'a' above.
- 4) If the acoustical study shows that the noise levels at any noise sensitive areas will exceed 75 dBA CNEL; the development should not be approved.
- 5) Interior noise levels should not exceed 45 dBA CNEL within any habitable living space of any residential unit.

Additionally, if the acoustical study shows that off-site noise levels at any noise sensitive receptor will increase by 3 dBA or more, due the proposed project; the development should look for a feasible mitigation plan.

### **State of California CCR Title 24**

The California Code of Regulations (CCR), Title 24, Noise Insulation Standards, states that multi-family dwellings, hotels, and motels located where the CNEL exceeds 60 dBA, must obtain an acoustical analysis showing that the proposed design will limit interior noise to less than 45 dBA CNEL. Interior noise standards are typically applied to sensitive areas within the structure where low noise levels are desirable (such as living rooms, dining rooms, bedrooms, and dens or studies).



Worst-case noise levels, either existing or future, must be used for this determination. Future noise levels must be predicted at least ten years from the time of building permit application. The County of San Diego has adopted the CCR Title 24 standards, although for the purposes of environmental analysis, utilizes the interior threshold (above) from the Noise Element of the General Plan. Thus, for the purposes of analysis, the applicable exterior noise design threshold is 60 dBA CNEL. The applicable interior noise standard is 45 dBA CNEL.



## **ANALYSIS METHODOLOGY**

### **Site Monitoring Procedure**

One Quest Model 2900 ANSI Type 2 integrating sound level meter was used as the data collection device. The meter locations (denoted as ML 1 and ML 2) were mounted to a tripod approximately five feet above the ground and were placed within the project boundaries. The meter was placed at the worst-case noise exposure location within project site. This was done in order to capture the existing noise levels within the proposed project site during normal afternoon traffic flow conditions. The monitoring locations are shown graphically in Figure 4 on the following page.

The measurements were performed on January 12, 2005 starting at approximately 3:00 p.m. All equipment was calibrated before testing at ISE's acoustics and vibration laboratory to verify conformance with ANSI S1-4 1983 Type 2 and IEC 651 Type 2 standards.

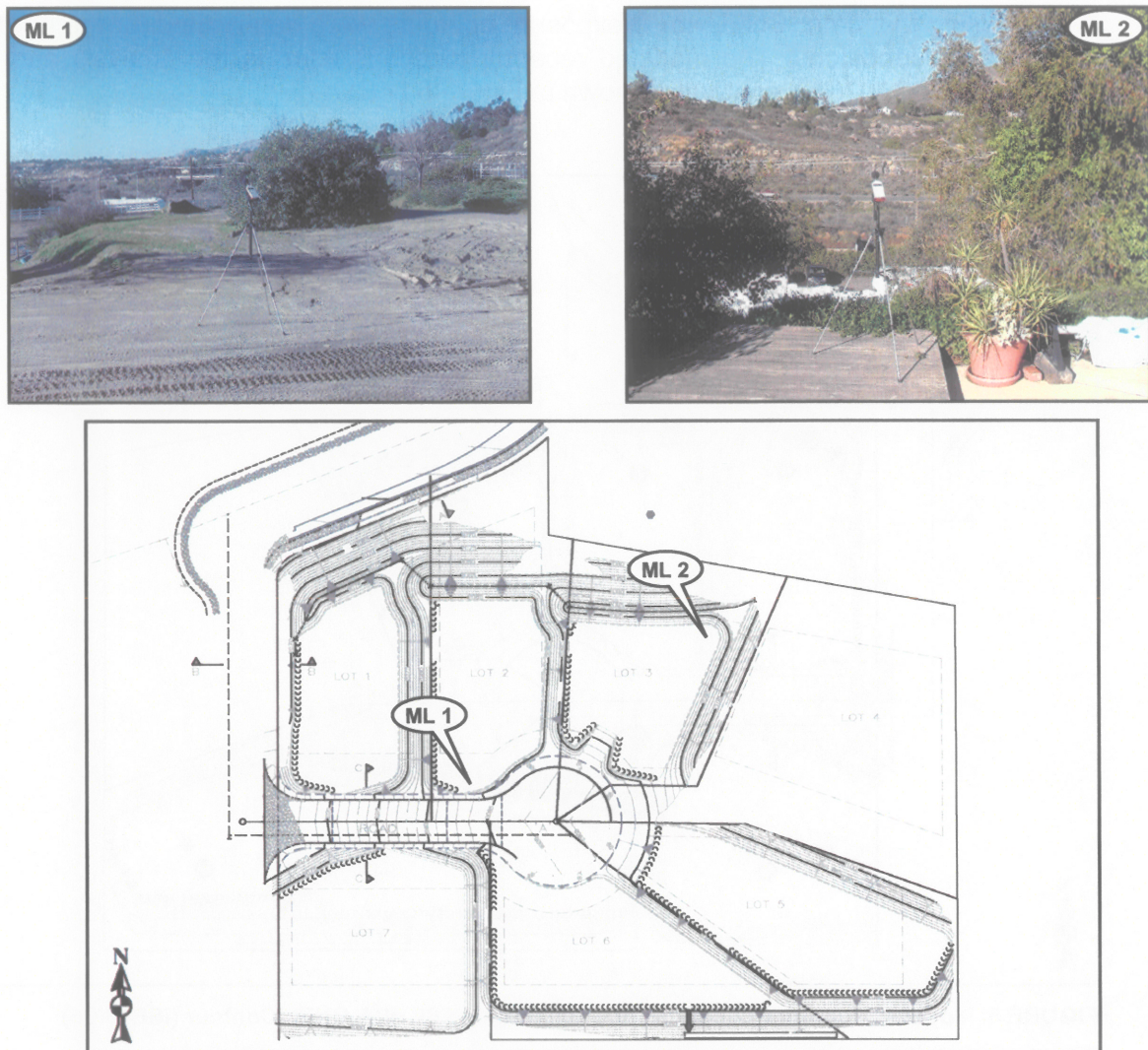
### **Traffic Noise Impact Assessment Approach**

The Caltrans Sound 32 Traffic Noise Prediction Model with California (CALVENO) noise emission factors (*based on FHWA RD-77-108 and FHWA/CA/TL-87/03 standards*) were used to calculate future onsite vehicular traffic noise levels. The Sound 32 model was calibrated in accordance with Appendix E of the FHWA Highway Traffic Noise Prediction Manual (Report RD-77-108) for a normalized Level of Service of 'C'. This is also in accordance with Caltrans Technical Noise Supplement (TeNS) sections N-5440 & N-5460 published October 1998.

#### **Model input included:**

- A digitized representation of all major roadways including Interstate 8 (88/5.4/6.6 traffic mix), Alpine Boulevard (95/3/2 traffic mix). The peak hour traffic value was calculated for a 10% traffic flow pattern.
- Receptor elevations.
- Topography and propose five-foot-high berm along Lots 1 through -3 as identified in the project site plans (*Source: Snipes-Dye Associates, 8/05*).





**FIGURE 4: Ambient Noise Monitoring Locations (ISE 1/05)**

Receptor elevations were considered five feet above the appropriate floor (pad) elevation and were taken near the center of the proposed rear yard areas of each lot. The model assumed a “soft” site sound propagation rule (i.e., a 4.5-dBA loss per doubling of distance from roadway to receiver). Second floor receptor areas were modeled at 15 feet above the respective pad elevation.

Model output consisted of peak hour energy-mean A-weighted sound levels (or Leq-h) for each receptor examined. For peak hour traffic percentages between approximately 8 and 12 percent, the energy-mean A-weighted sound level is equivalent to the Community Noise Equivalent Level (CNEL). Outside this range, a maximum variance of up to two dBA occurs between Leq-h and CNEL.



Using this data, CNEL noise exposure contours were determined for the 60-dBA ground floor conditions. The modeled receptor locations used in the analysis and the predicted 60 dBA CNEL contour is shown in Figure 5 below.

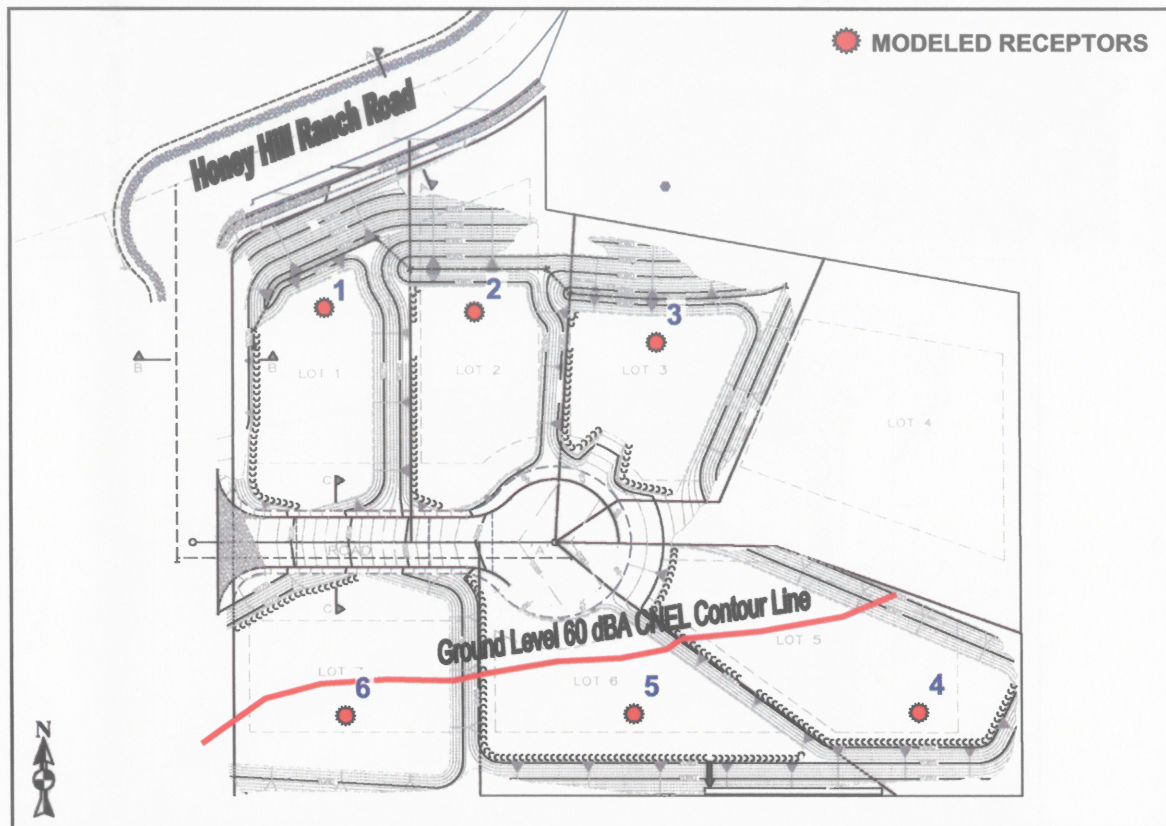


FIGURE 5: Modeled Receptor Locations and Unmitigated 60 dBA CNEL Contour (ISE, 8/05)

## FINDINGS / RECOMMENDATIONS

Testing conditions during the monitoring period were mostly sunny with an average barometric pressure reading of 30.01 in-Hg, an average southwesterly wind speed of 2 to 5 miles per hour (MPH), and an approximate mean temperature of 68 degrees Fahrenheit. The results of the sound level monitoring are shown below in Table 1 on the following page. The values for the equivalent sound level ( $L_{eq}$ ), the maximum and minimum measured sound levels ( $L_{max}$  and  $L_{min}$ ), and the statistical indicators  $L_{10}$ ,  $L_{50}$ , and  $L_{90}$ , are given for each monitoring location.

Noise levels on site were found to be consistent with the observed community setting and topography. The value for the equivalent sound level ( $L_{eq-h}$ ) within the project site was found to be between 57 and 65 dBA and was solely a function of the separation distance between nearby roadways. Background noise levels (i.e.,  $L_{90}$



levels) were found to be approximately 3 dBA lower than the energy equivalent counterpart (e.g., Leq-h) indicating the relative frequency of traffic noise along I-8. The acoustic floor for the site, as indicated by the Lmin metric, was found to be approximately 54 and 60 dBA.

**TABLE 1: Measured Ambient Sound Levels – Honey Hill Ranch Road Site Development**

Site	Start Time	1-Hour Noise Level Descriptors in dBA					
		Leq	Lmax	Lmin	L10	L50	L90
ML 1	4:00 p.m.	57.3	60.9	53.6	59.3	56.9	54.9
ML 2	3:00 p.m.	64.6	68.6	60.2	66.8	64.0	61.5

Monitoring Locations:

- o ML 1: Adjacent to existing residence - GPS N32° 49.979 x W116° 48.637.
- o ML 2: Center of project site – GPS N32° 50.006 x W116° 44.900.

Measurements performed by ISE on January 12, 2005. Estimated Position Error (EPE) = 15 feet.

**Future Traffic Noise Impacts**

The primary source of future noise near the project site would be from the combination of vehicular traffic along I-8 and Alpine Boulevard. These roadways are expected to have worst-case future traffic volumes of 56,000 ADT and 18,000 ADT respectively (*Source: SANDAG Series 10 Prediction Model, 2005*). The results of the acoustical modeling are shown in Table 2 on the following page. The acoustical model files are provided as an attachment to this report.

**TABLE 2: Acoustical Modeling Results – Honey Hill Ranch Road Development**

Receptor #	Ground Floor Unmitigated (with five-foot-high berm)	Ground Floor Mitigated (with six-foot high wall atop of the proposed berm)	Second Floor Resultant Levels
1	63.4	60.0	66.3
2	64.0	60.1	67.0
3	64.4	59.9	67.4
4	57.6	56.6	60.1
5	59.1	58.2	61.6
6	59.5	59.0	60.8

Note: All Levels Given in dBA CNEL



Future exterior traffic noise levels would exceed the County's noise threshold standard of 60-dBA CNEL for Lots 1 through 3. Thus, exterior mitigation would be required in the form of a six-foot high screen wall atop the proposed five-foot-high berm previously identified. This combination solution was found to mitigate exterior noise levels within the County's acceptable 60 dBA CNEL noise threshold. The proposed design can be seen in Figure 6 below.

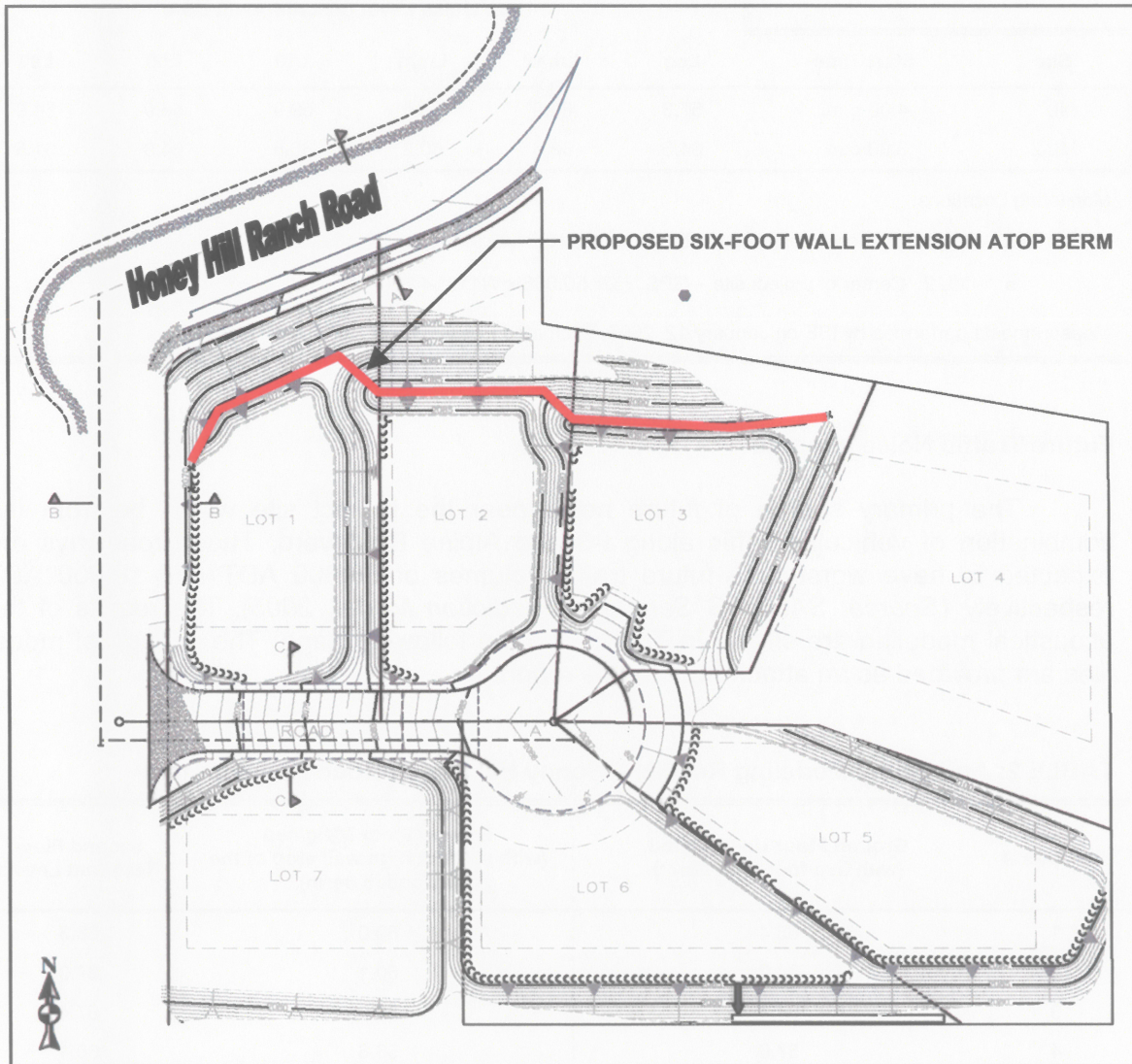


FIGURE 6: Proposed Mitigation Plan for Project Site (ISE 8/05)



Additionally, second-floor areas for all proposed residential lots within the development would exceed the CCR Title 24 and County of San Diego noise abatement threshold of 60 dBA CNEL. Thus, in accordance with the proposed development plan, interior noise mitigation (i.e., specialized door and window treatments) would be required if a two story structure is proposed on the respective Lots.

The future predicted CNEL noise exposure contours were also determined for the proposed project after incorporation of the six-foot-high noise screen wall atop a five-foot-high berm. The 60 dBA CNEL noise contours for both ground and second floor conditions are shown below in Figure 7. In addition, the closest point of reference distance from the centerline of west bound Interstate 8 to the 60 dBA CNEL contours is provided.

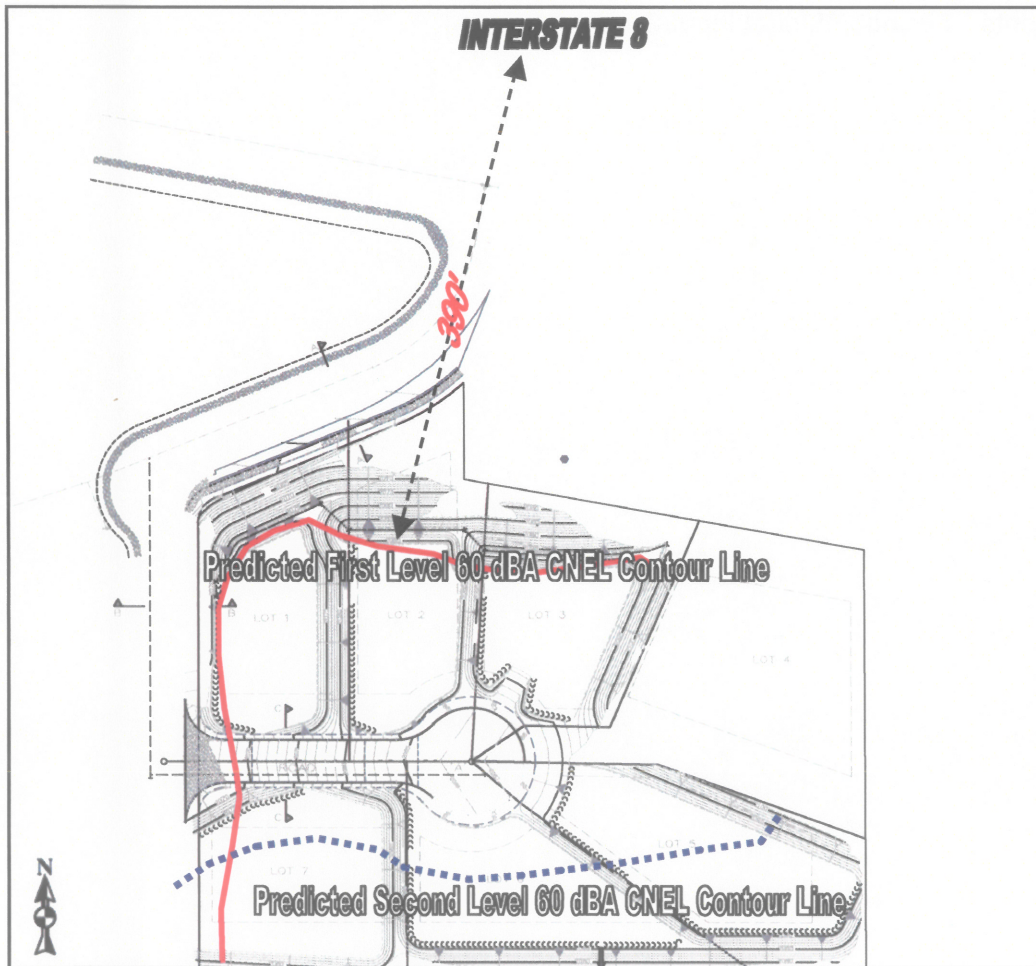


FIGURE 7: CNEL Noise Contours with Mitigation (ISE 8/05)



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Should you have any questions regarding the above conclusions, please do not hesitate to contact me at (858) 451-3505.

Sincerely,

A handwritten signature in black ink, appearing to read "Rick TAVARES". The signature is stylized with a large, looped "R" and a trailing "S".

Rick Tavares, Ph.D.  
Project Principal  
Investigative Science and Engineering, Inc.

Cc: Ryan Taylor, ISE

Attachments: Sound32 Model Input/Output Decks



**S32 INPUT DECK – GROUND FLOOR UNMITIGATED**

HONEY HILL - GROUND LEVEL UNMITIGATED

T-PEAK HOUR TRAFFIC CONDITIONS, 1

2464 , 65 , 151 , 65 , 185 , 65

T-PEAK HOUR TRAFFIC CONDITIONS, 2

2464 , 65 , 151 , 65 , 185 , 65

T-PEAK HOUR TRAFFIC CONDITIONS, 3

1710 , 45 , 54 , 45 , 36 , 45

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519.,652,92,92,



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R, 5 , 65 ,10  
550,454,91,L6  
R, 6 , 65 ,10  
377,448,81,L7  
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D, 4.5  
2 ,ALL  
C,C



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SOUND32 - RELEASE 07/30/91

TITLE: HONEY HILL - GROUND LEVEL UNMITIGATED

BARRIER DATA  
\*\*\*\*\*

BAR ELE	0	1	BARRIER HEIGHTS					6	7	BAR ID	LENGTH	TYPE
1	-	0.*								B1 P1	769.0	BERM
2	-	0.*								B1 P2	173.7	BERM
3	-	0.*								B1 P3	1025.3	BERM
4	-	0.*								B2 P1	1068.6	BERM
5	-	0.*								B2 P2	422.1	BERM
6	-	0.*								B2 P3	609.4	BERM
7	-	0.*								B2 P4	572.2	BERM
8	-	0.*								B3 P1	1509.8	BERM
9	-	0.*								B3 P2	608.3	BERM
10	-	0.*								B3 P3	560.2	BERM
11	-	0.*								B3 P4	766.3	BERM
12	-	0.*								B4 P1	32.2	MASONRY
13	-	0.*								B4 P2	69.8	MASONRY
14	-	0.*								B4 P3	31.4	MASONRY
15	-	0.*								B4 P4	87.0	MASONRY
16	-	0.*								B4 P5	23.3	MASONRY
17	-	0.*								B4 P6	82.1	MASONRY
18	-	0.*								B4 P7	53.8	MASONRY
19	-	0.*								B5 P1	56.0	BERM
20	-	0.*								B6 P1	15.8	BERM
21	-	0.*								B6 P2	73.0	BERM
22	-	0.*								B7 P1	15.8	BERM
23	-	0.*								B7 P2	63.1	BERM
24	-	0.*								B8 P1	34.2	BERM
25	-	0.*								B8 P2	52.6	BERM
26	-	0.*								B8 P3	107.9	BERM
27	-	0.*								B8 P4	108.0	BERM
28	-	0.*								B8 P5	59.2	BERM
29	-	0.*								B8 P6	40.7	BERM
30	-	0.*								B9 P1	99.0	BERM
31	-	0.*								B9 P2	77.6	BERM
32	-	0.*								B9 P3	55.1	BERM
33	-	0.*								B9 P4	22.4	BERM
34	-	0.*								B9 P5	96.0	BERM

REC	REC ID	DNL	PEOPLE	LEQ (CAL)
1	L1	65.	10.	63.4
2	L2	65.	10.	64.0
3	L3	65.	10.	64.4
4	L5	65.	10.	57.6
5	L6	65.	10.	59.1
6	L7	65.	10.	59.5



### S32 INPUT DECK – GROUND FLOOR MITIGATED

#### HONEY HILL - GROUND LEVEL MITIGATED

T-PEAK HOUR TRAFFIC CONDITIONS, 1

2464 , 65 , 151 , 65 , 185 , 65

T-PEAK HOUR TRAFFIC CONDITIONS, 2

2464 , 65 , 151 , 65 , 185 , 65

T-PEAK HOUR TRAFFIC CONDITIONS, 3

1710 , 45 , 54 , 45 , 36 , 45

L-8 WEST, 1

N,-963,1618,30,

N,-237,1434,65,

N,515,1266,83,

N,1113,1175,65,

N,1671,1160,58,

N,2478,1173,75,

L-8 EAST, 2

N,-968,1481,25,

N,-240,1300,60,

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803.,478,91,91,  
784.,442,91,91,  
B-L7, 9 , 1 , 0 , 0  
316,431,76,76,  
316,530,76,76,  
391,550,76,76,  
444,535,76,76,  
464,535,86,86,  
466,439,86,86,  
R, 1 , 65 ,10  
376,711,77.,L1  
R, 2 , 65 ,10  
471,710,89.,L2  
R, 3 , 65 ,10  
568,700,97.,L3  
R, 4 , 65 ,10  
735,475,96,L5  
R, 5 , 65 ,10  
550,454,91,L6  
R, 6 , 65 ,10  
377,448,81,L7  
D, 4.5  
1 ,ALL  
D, 4.5  
2 ,ALL  
C,C



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TITLE: HONEY HILL - GROUND LEVEL MITIGATED

BARRIER DATA

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BAR ELE	0	1	BARRIER HEIGHTS					6	7	BAR ID	LENGTH	TYPE
1	-	0.*								B1 P1	769.0	BERM
2	-	0.*								B1 P2	173.7	BERM
3	-	0.*								B1 P3	1025.3	BERM
4	-	0.*								B2 P1	1068.6	BERM
5	-	0.*								B2 P2	422.1	BERM
6	-	0.*								B2 P3	609.4	BERM
7	-	0.*								B2 P4	572.2	BERM
8	-	0.*								B3 P1	1509.8	BERM
9	-	0.*								B3 P2	608.3	BERM
10	-	0.*								B3 P3	560.2	BERM
11	-	0.*								B3 P4	766.3	BERM
12	-	6.*								B4 P1	32.2	MASONRY
13	-	6.*								B4 P2	69.8	MASONRY
14	-	6.*								B4 P3	31.4	MASONRY
15	-	6.*								B4 P4	87.0	MASONRY
16	-	6.*								B4 P5	23.3	MASONRY
17	-	6.*								B4 P6	82.1	MASONRY
18	-	6.*								B4 P7	53.8	MASONRY
19	-	0.*								B5 P1	56.0	BERM
20	-	0.*								B6 P1	15.8	BERM
21	-	0.*								B6 P2	73.0	BERM
22	-	0.*								B7 P1	15.8	BERM
23	-	0.*								B7 P2	63.1	BERM
24	-	0.*								B8 P1	34.2	BERM
25	-	0.*								B8 P2	52.6	BERM
26	-	0.*								B8 P3	107.9	BERM
27	-	0.*								B8 P4	108.0	BERM
28	-	0.*								B8 P5	59.2	BERM
29	-	0.*								B8 P6	40.7	BERM
30	-	0.*								B9 P1	99.0	BERM
31	-	0.*								B9 P2	77.6	BERM
32	-	0.*								B9 P3	55.1	BERM
33	-	0.*								B9 P4	22.4	BERM
34	-	0.*								B9 P5	96.0	BERM

REC	REC ID	DNL	PEOPLE	LEQ (CAL)
1	L1	65.	10.	60.0
2	L2	65.	10.	60.1
3	L3	65.	10.	59.9
4	L5	65.	10.	56.6
5	L6	65.	10.	58.2
6	L7	65.	10.	59.0



### S32 INPUT DECK – SECOND FLOOR RESULTANT LEVELS

HONEY HILL - SECOND LEVEL MITIGATED  
T-PEAK HOUR TRAFFIC CONDITIONS, 1  
2464 , 65 , 151 , 65 , 185 , 65  
T-PEAK HOUR TRAFFIC CONDITIONS, 2  
2464 , 65 , 151 , 65 , 185 , 65  
T-PEAK HOUR TRAFFIC CONDITIONS, 3  
1710 , 45 , 54 , 45 , 36 , 45  
L-8 WEST, 1  
N,-963,1618,30,  
N,-237,1434,65,  
N,515,1266,83,  
N,1113,1175,65,  
N,1671,1160,58,  
N,2478,1173,75,  
L-8 EAST, 2  
N,-968,1481,25,  
N,-240,1300,60,  
N,513,1123,74,  
N,1114,1054,60,  
N,1675,1034,54,  
N,2457,1048,70,  
L-ALPINE, 3  
N,-242,1128,30,  
N,470,1022,60,  
N,695,981,60,  
N,1705,813,13,  
B-ROAD EDGE, 1 , 1 , 0 ,0  
-240,1107,30,30,  
517,975,60,60,  
685,931,60,60,  
1700,794,13,13,  
B-ROAD EDGE, 2 , 1 , 0 ,0  
-937.,1443,25,25,  
97.,1177,70,70,  
508.,1081,77,77,  
1113.,1010,60,60,  
1685.,995,55,55,  
B-ROAD EDGE, 3 , 1 , 0 ,0  
-954,1575,30,30,  
514,1226,83,83,  
1115,1134,65,65,  
1675,1120,58,58,  
2441,1132,75,75,  
B-WALL, 4 , 2 , 0 ,0  
323.,708,72,78,  
338.,736,77,83,  
401.,766,77,83,  
422.,746,89,95,  
509.,746,89,95,  
524.,730,97,103,  
606.,727,97,103,  
659.,736,97,103,  
B-L1, 5 , 1 , 0 ,0  
323.,708,72,72,  
323.,652,72,72,  
B-L2, 6 , 1 , 0 ,0  
422.,746,89,89,  
422.,731,84,84,  
422.,658,84,84,  
B-L3, 7 , 1 , 0 ,0  
524.,730,97,97,  
523.,715,92,92,  
519.,652,92,92,



B-L4, 8 , 1 , 0 , 0  
659., 736, 97, 97,  
655., 703, 105, 105,  
702., 680, 110, 110,  
803., 642, 110, 110,  
806., 534, 110, 110,  
803., 478, 91, 91,  
784., 442, 91, 91,  
B-L7, 9 , 1 , 0 , 0  
316, 431, 76, 76,  
316, 530, 76, 76,  
391, 550, 76, 76,  
444, 535, 76, 76,  
464, 535, 86, 86,  
466, 439, 86, 86,  
R, 1 , 65 , 10  
376, 711, 87., L1  
R, 2 , 65 , 10  
471, 710, 99., L2  
R, 3 , 65 , 10  
568, 700, 107., L3  
R, 4 , 65 , 10  
735, 475, 106., L5  
R, 5 , 65 , 10  
550, 454, 101., L6  
R, 6 , 65 , 10  
377, 448, 91., L7  
C, C



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TITLE: HONEY HILL - SECOND LEVEL MITIGATED

BARRIER DATA  
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BAR ELE	0	1	BARRIER HEIGHTS					6	7	BAR ID	LENGTH	TYPE
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4	-	0.*								B2 P1	1068.6	BERM
5	-	0.*								B2 P2	422.1	BERM
6	-	0.*								B2 P3	609.4	BERM
7	-	0.*								B2 P4	572.2	BERM
8	-	0.*								B3 P1	1509.8	BERM
9	-	0.*								B3 P2	608.3	BERM
10	-	0.*								B3 P3	560.2	BERM
11	-	0.*								B3 P4	766.3	BERM
12	-	6.*								B4 P1	32.2	MASONRY
13	-	6.*								B4 P2	69.8	MASONRY
14	-	6.*								B4 P3	31.4	MASONRY
15	-	6.*								B4 P4	87.0	MASONRY
16	-	6.*								B4 P5	23.3	MASONRY
17	-	6.*								B4 P6	82.1	MASONRY
18	-	6.*								B4 P7	53.8	MASONRY
19	-	0.*								B5 P1	56.0	BERM
20	-	0.*								B6 P1	15.8	BERM
21	-	0.*								B6 P2	73.0	BERM
22	-	0.*								B7 P1	15.8	BERM
23	-	0.*								B7 P2	63.1	BERM
24	-	0.*								B8 P1	34.2	BERM
25	-	0.*								B8 P2	52.6	BERM
26	-	0.*								B8 P3	107.9	BERM
27	-	0.*								B8 P4	108.0	BERM
28	-	0.*								B8 P5	59.2	BERM
29	-	0.*								B8 P6	40.7	BERM
30	-	0.*								B9 P1	99.0	BERM
31	-	0.*								B9 P2	77.6	BERM
32	-	0.*								B9 P3	55.1	BERM
33	-	0.*								B9 P4	22.4	BERM
34	-	0.*								B9 P5	96.0	BERM

REC	REC ID	DNL	PEOPLE	LEQ (CAL)
1	L1	65.	10.	66.3
2	L2	65.	10.	67.0
3	L3	65.	10.	67.4
4	L5	65.	10.	60.1
5	L6	65.	10.	61.6
6	L7	65.	10.	60.8